Cost Risk Analysis

Design GW Remediation

COSDEN CHEMICAL COATINGS SUPERFUND SITE

BEVERLY, NEW JERSEY

2007 Superfund Remediation Conference (SRC)

January 23 through 25, 2007
New Orleans, Louisiana

Cosden Chemical Coatings, Beverly, New Jersey

Site History

- The Site is located in the City of Beverly, Burlington, New Jersey and occupies approximate 6.7 Acres.
- Former Paint Formulation and Manufacturing Facility 1945 – 1985.
- Produced Paints and Coatings for Industrial Applications.
- Spent Solvents were stored at the site beginning in 1974 and accumulated until 1985, when the owner abandoned the site.
- As a result of surface spills, soil and groundwater became contaminated with Volatile Organic Compounds (VOCs) and some Heavy Metals.

Contaminants of Concern

→ **Soil:**

VOC's: Toluene, Xylene, Ethylbenzene, TCE

Heavy Metals: Chromium, Lead

PCBs

→ **Groundwater:**

VOC's: Toluene, Xylene, Ethylbenzene, TCE

Heavy Metals: Chromium, Lead

Cosden Chemical Coatings
Pre-ROD Activities

- SITE ADDED TO NPL – July 1987
- REMOVAL ACTION – June 1989
  - Secure Site With Fencing
  - Remove & Dispose:
    - **75 Lab Pack Drums**
    - **300 Drums**
    - **2,000 gal. Bulk Liquids**
    - **350 Empty Containers**

Cosden Chemical Coatings
ROD Selected Remedies

- Record of Decision (ROD)– Signed Sept. 1992
- **OU-1: (Above ground) Decontamination, Demolition and Off-Site Disposal of Building Debris. (Completed in 1995).**
- **OU-2: (Soils) In-situ Stabilization of 8,000 Cubic Yards of Inorganic and PCB Contaminated Soil (Subsequently Changed to Soil Removal and Off-Site Disposal). (Completed 1999 & 2002).**
- **OU 3: (Groundwater) Groundwater Extraction, Precipitation, Treatment by Air Stripping, and Recharge to the Aquifer.**

Current Cosden Chemical Site Photo

COSDEN CHEMICAL COATINGS

THE DESIGN TEAM

OU-3 GROUNDWATER REMEDIATION

- **Client – USEPA Region II**
- **Design Manager- Baltimore District, Corps of Engineers**
- **Designer – URS, Inc.**
- **Independent Reviewer– Philadelphia District, Corps of Engineers**

OU-3 GROUNDWATER REMEDIATION

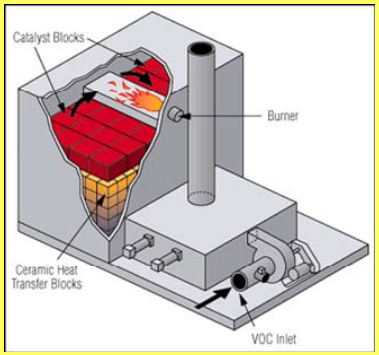
Original Design Features (35%):

- **GW Extraction and Removal of VOCs Using Air Stripper.**
- **On-Site Aquifer Recharge of Treated GW.**
- **Destruction of VOCs in Combined Air Streams from the Air Stripper and Soil Vapor Extraction (SVE) Systems by Catalytic Oxidation.**

OU-3 GROUNDWATER REMEDIATION

DESIGN FEATURES (35%)

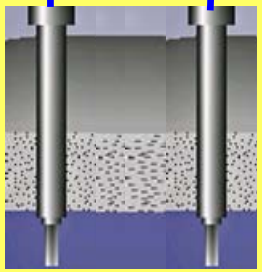
CATALYTIC OXIDIZER



VOCs

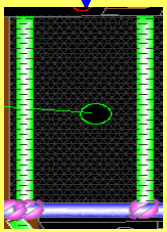
CONTAMINATED GW

AIR STRIPPER



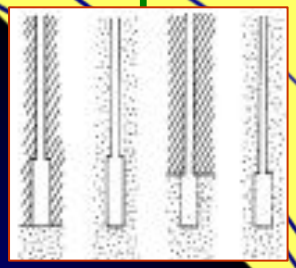
GROUNDWATER EXTRACTION WELLS

TREATED GW



GROUNDWATER INJECTION

VOCs



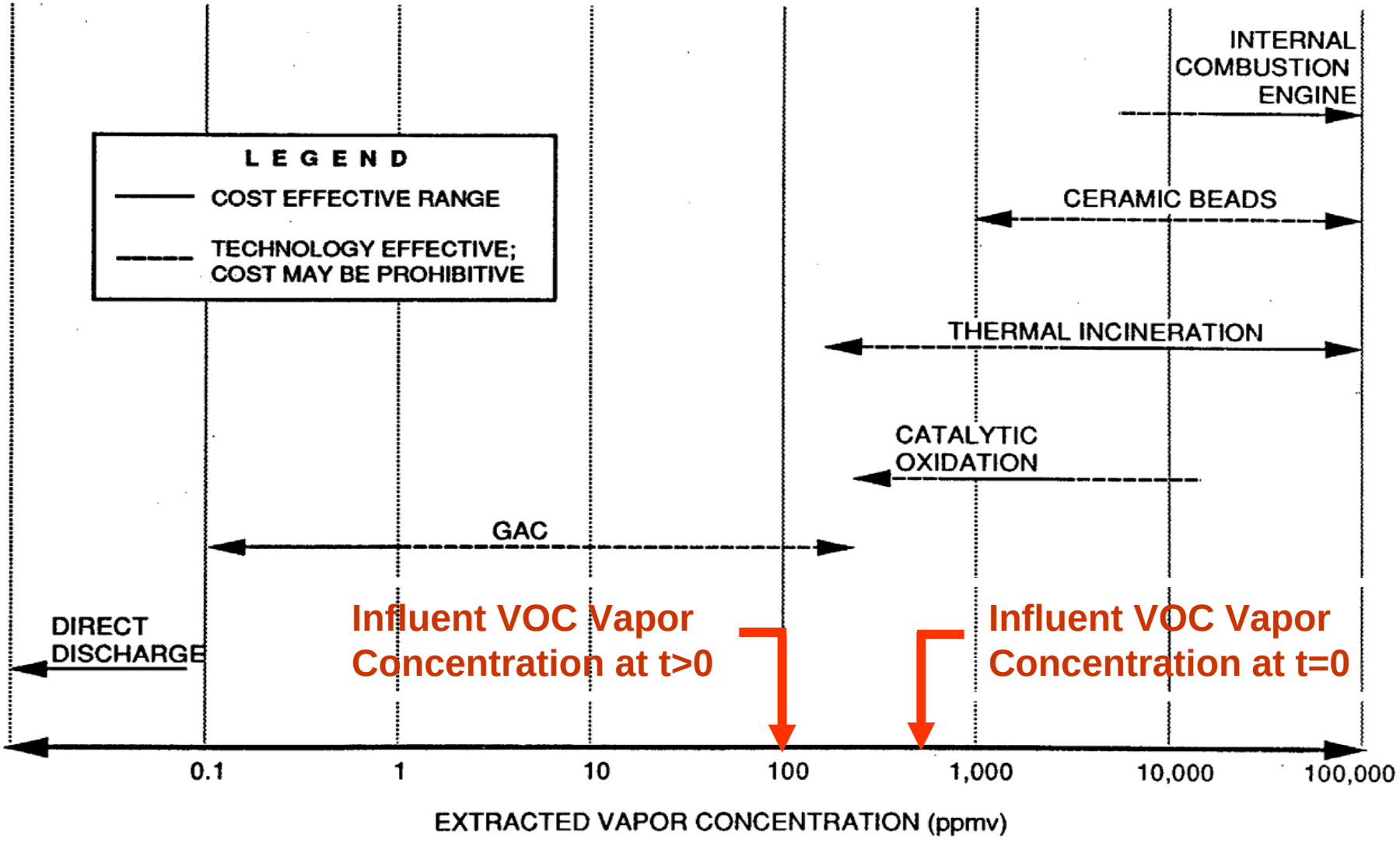
SOIL VAPOR EXTRACTION

OU-3 GROUNDWATER REMEDIATION

USEPA's Design Review Requirements

- ❑ Minimum Capital and O&M Costs
- ❑ Maximize Reliability
- ❑ Minimize Negative Public Perception
- ❑ Independent Technical Review
- ❑ Meet ROD Requirements

OU-3 GROUNDWATER REMEDIATION
Review Process (published guidance)



EPA-540-2-91-003 Feb. 1991 Fig. 23

OU-3 GROUNDWATER REMEDIATION
Proposed Design Changes

1) **GW VOC Treatment Technology**

Air Stripper → Liquid Phase Carbon (LGAC)

2) **SVE VOC Treatment Technology**

Catalytic Oxidizer → Vapor Phase Carbon (VGAC)

3) **GW Injection Gallery Construction**

Depth of 18 Feet → Depth of 5 Feet

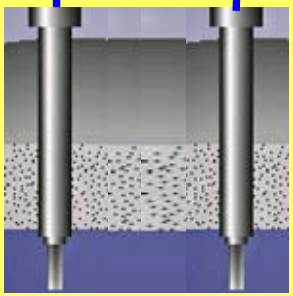
ACTUAL OU-3 GROUNDWATER DESIGN

DESIGN FEATURES (100%)

Vapor Phase Carbon

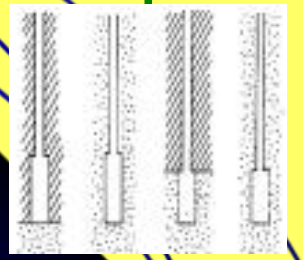
Liquid Phase Carbon

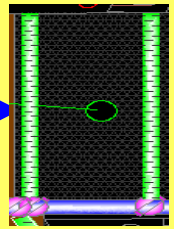
CONTAMINATED GW



TREATED GW

VOCs





GROUNDWATER EXTRACTION WELLS

SOIL VAPOR EXTRACTION (SVE)

GROUNDWATER INJECTION GALLERY

COST RISK ANALYSIS

COST ESTIMATES

Remedial Technology	CAPITAL $	0-6 Months O&M $	7-60 Months O&M $	TOTAL COST $
Catalytic Thermal Oxidizer	$245,000	$83,000	$695,000	$1,023,000
vs.				
Gaseous Phase GAC	$73,000	$92,000	491,000	$656,000

O&M COST RISK FACTORS

Remedial Technology	RELIABILITY	OPERATIONAL COST	OPERATIONAL COMPLEXITY	PUBLIC PERCEPTION
Catalytic Thermal Oxidizer	Medium-High	Very High	High-Very High	High
vs.				
Gaseous Phase GAC	Very High	Low	Low	Low

OU-3 GROUNDWATER REMEDIATION

Design Review (Cost Risk Analysis)

- EPA, URS and the Corps of Engineers Worked Together to Improve the Design.
- The Philadelphia District's (COE) Proposed Design Changes based on Experience in Other Superfund Sites.
- URS Evaluated and Incorporated the Proposed Changes in the Design.

The Value of Cost Risk Analysis

- Cost Savings
  - Construction Cost → $330,000
  - O&M Cost → $125,000/year*
- Simplified O&M
- Improved Reliability
- Improved Public Relations

* Average Over a 5 year period

Cost Risk Management (In Partnering)

Recipe For Success

- Knowledge of Customer Needs
- Team Work
- Related Experience
- Local Knowledge
- Address Early in the Design